ATTACHED ARE:

1) A transcribed copy of BAA 99-06 as it appeared in the *Commerce Business Daily* (CBD) of October 22, 1998 and

2) the BAA 99-06 Proposer Information Pamphlet.

Due to the possibility of transcription errors, the official CBD announcement takes precedence over this transcription in any disagreement between the two. The transcription is provided for your convenience only.

EXTENSIBLE NETWORKS AND THE NEXT GENERATION INTERNET SOL BAA 99-06 DUE 01/11/99 POC Dr. Mari Maeda, DARPA/ITO, FAX: (703) 522-7161 WEB: http://www.ito.darpa.mil. E-MAIL: baa99-06@darpa.mil.

The Next Generation Internet (NGI) initiative is accelerating the development of networking capabilities that will enable a new wave of revolutionary applications. The new advances will enable a vast increase in the geographic scope and heterogeneity of access to the information infrastructure and ensure that the capacity of the core network and its services can be efficiently and robustly scaled to accommodate accelerated growth.

The term Extensible Networking emphasizes the need for the underlying networks and services to accommodate change, both with respect to the diversity and aggregate volume of: the attached devices, the services that are provided, and the resultant network traffic. As the rapid proliferation of Web browsers and $10 modems has demonstrated, innovation and entrepreneurial spirit can sweep away decades of usage and traffic assumptions in a matter of months.

This solicitation seeks proposals in the following technical topic areas of relevance to NGI and Extensible Networks:
Revolutionary NGI Applications
Gigabit Capacity Wireless Networking
Internetworking with Low Earth Orbiting Satellites
Deeply Networked Systems

PROGRAM SCOPE:

Proposed research should investigate innovative approaches and techniques that lead to or enable revolutionary advances in the state-of-the-art. Proposals are not limited to the specific strategies listed above and alternative visions will be considered. However, proposals should be for research that substantially contributes towards the goals stated. Research should result in prototype hardware and/or software demonstrating integrated concepts and approaches. Specifically excluded is research that primarily results in

evolutionary improvement to the existing state of practice or focuses on a specific system or solution. Integrated solution sets embodying significant technological advances are strongly encouraged over narrowly defined research endeavors. Proposals may involve other research groups or industrial cooperation and cost sharing.

GENERAL INFORMATION:

In order to minimize unnecessary effort in proposal preparation and review, proposers are strongly encouraged to submit brief proposal abstracts in advance of full proposals. An original and eight (8) copies of the proposal abstract must be submitted to DARPA/ITO, ATTN: BAA 99-06, 3701 North Fairfax Drive, Arlington, VA 22203-1714, in time to reach DARPA by 4:00 PM (ET), Monday, November 23, 1998, to guarantee review. Upon review, DARPA will make a recommendation to offerors either encouraging or discouraging submission of full proposals.

Proposers must submit an original and eight (8) copies of full proposals in time to reach DARPA by 4:00 PM (ET), Monday, January 11, 1999, in order to be considered. Proposers must obtain a pamphlet, BAA 99-06 Proposer Information, which provides further information on the areas of interest, submission, evaluation, funding processes, proposal abstracts, and full proposal formats. This pamphlet may be obtained by fax, electronic mail, or mail request to the administrative contact address given below, as well as at URL address http://www.ito.darpa.mil/Solicitations.html. Proposals not meeting the format described in the pamphlet may not be reviewed. This Commerce Business Daily notice, in conjunction with the pamphlet BAA 99-06 Proposer Information, constitutes the total BAA. No additional information is available, nor will a formal RFP or other solicitation regarding this announcement be issued. Requests for same will be disregarded.

The Government reserves the right to select for award all, some, or none of the proposals received.

All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities (HBCU) and Minority Institutions (MI) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for HBCU and MI participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities.

Evaluation of proposals will be accomplished through a scientific review of each proposal using the following criteria, which are listed in descending order of relative importance:
(1) overall scientific and technical merit,
(2) potential contribution and relevance to DARPA mission,
(3) offeror's capabilities and related experience,
(4) plans and capability to accomplish technology transition, and
(5) cost realism.

All administrative correspondence and questions on this solicitation, including requests for information on how to submit a proposal abstract or proposal to this BAA, must be directed to one of the administrative addresses below by 4:00 PM (ET), Monday, January 4, 1999; e-mail or fax is preferred. DARPA intends to use electronic mail and fax for some of the correspondence regarding BAA 99-06. Proposals and proposal abstracts may not be submitted by fax; any so sent will be disregarded.

The administrative addresses for this BAA are:
Fax: 703-522-7161 Addressed to: DARPA/ITO, BAA 99-06
Electronic Mail: baa99-06@darpa.mil
Electronic File Retrieval: http://www.ito.darpa.mil/Solicitations.html
Mail: DARPA/ITO
ATTN: BAA 99-06
3701 North Fairfax Drive
Arlington, VA 22203-1714

Posted 10/20/98 (W-SN263522). (0293)

SPONSOR: Defense Advanced Research Projects Agency (DARPA), Contract Management Directorate (CMD), 3701 N. Fairfax Dr., Arlington, VA 22203-1714

SUBFILE: PSE (U.S. GOVERNMENT PROCUREMENTS, SERVICES)
SECTION HEADING: A Research and Development
PUBLICATION DATE: OCTOBER 22, 1998
ISSUE: PSA-2206

BAA 99-06 PROPOSER INFORMATION PAMPHLET

The Defense Advanced Research Projects Agency (DARPA) often selects its research efforts through the Broad Agency Announcement (BAA) process. The BAA will appear first in the *Commerce Business Daily*, published by the U.S. Government, Department of Commerce. The following information is for those wishing to respond to the Broad Agency Announcement.

EXTENSIBLE NETWORKS AND THE NEXT GENERATION INTERNET SOL BAA 99-06 DUE 1/11/99 POC Dr. Mari Maeda, DARPA/ITO, FAX: (703) 522-7161

The Next Generation Internet (NGI) initiative is accelerating the development of networking capabilities that will enable a new wave of revolutionary applications. The new advances will enable a vast increase in the geographic scope and heterogeneity of access to the information infrastructure and ensure that the capacity of the core network and its services can be efficiently and robustly scaled to accommodate accelerated growth.

The term Extensible Networking emphasizes the need for the underlying networks and services to accommodate change, both with respect to the diversity and aggregate volume

of: the attached devices, the services that are provided, and the resultant network traffic. As the rapid proliferation of Web browsers and $10 modems has demonstrated, innovation and entrepreneurial spirit can sweep away decades of usage and traffic assumptions in a matter of months.

This solicitation seeks proposals in the following technical topic areas of relevance to NGI and Extensible Networks:

- Revolutionary NGI Applications
- Gigabit Capacity Wireless Networking
- Internetworking with Low Earth Orbiting Satellites
- Deeply Networked Systems

Technical Topic Areas

(1) Revolutionary NGI Applications: DARPA solicits proposals for research in new applications that are uniquely enabled by and take advantage of NGI's advanced networking capabilities. Emphasis is placed on bandwidth intensive applications that require Gigabit-per-second sustained or burst throughput and/or very low latency. Consideration will also be given to applications that require modest bandwidth per connection but may nonetheless result in generation of a large number of streams being carried over any given link such that very large aggregate capacity is required.

Examples of applications of interest include, but are not restricted to: remote manipulation and control, tele-presence, visualization including three-dimensional projection, transfer and sharing of geographical information and high-resolution imagery, transfer of bulk data, communication of wideband sampled information from sensors and instruments, such as antennas, radars, MRI scanners etc. Applications with the potential to enhance DOD operations and warfighting capability are of special interest.

Proposals should have clearly defined and measurable objectives. Efforts should be feedback-driven, with rapid prototyping completed within the first third of the project followed by phased enhancements. Demonstrations and field trials over DARPA's SuperNet testbed should be described and the collaborating sites and institutions identified. Proposals must also articulate the unique NGI capability that is being employed, together with the quantifiable stress that will be applied to the network.

(2) Gigabit Capacity Wireless Networking: While fiberoptic links provide the means for building robust high-capacity networking infrastructure, high speed wireless offers the potential for flexibly extending the reach of fixed terrestrial NGI infrastructure and for rapidly deploying a network at times of crises. Proposals are sought for experimental demonstrations of new techniques that enable Gigabit-per-second, aggregated or burst, wireless connectivity and networking. Both mobile and fixed wireless technologies will be considered, however for the latter, an emphasis is placed on speed and ease of deployment and configurability. Of particular interest will be expanding the operational

space for gigabit wireless in terms of coverage, susceptibility to environmental vagaries and robustnes.

Submissions should describe the bench experiment system that will be built and evaluated, and the quantitative performance targets that are anticipated (e.g. bandwidth, distance, environmental conditions, ease of configuration). Innovations in the proposed technical approach as well as the basis for such innovative claims should be clearly delineated and the schedule of milestones should be specific about the capability to be demonstrated as part of the program. Prototyping and the first round of evaluations should take place before the mid-stage of the project, followed by demonstrations of enhancements during the latter half of the project.

(3) Internetworking with Low Earth Orbiting Satellites (LEOS): Proposals are solicited for networking innovations that leverage commercially available LEOS technology. Examples include research into inter-operations across multiple satellite constellations and hybrid wired-wireless architectures that extend reach, flexibility and survivability. Partnerships with commercial LEOS ventures are strongly encouraged.

(4) Deeply Networked Systems: Today's PCs, laptops and PDAs represent the harvest from over thirty years of federal investment in "interactive computing", an approach in which users directly interact with their computers and mediate the flow of information. However, extending our abilities to monitor and shape our physical environment will require a much "deeper" approach to information systems - one that manages the vast quantities of "physical" information that can be accessed by sensors and actuators in direct contact with real world processes. To enable this transition, the information infrastructure must be extended to deal with: a wide diversity of embedded devices dealing in physical world information; vast increases in the number of nodes; and operating regimes in which autonomous operation is an essential component, due to the short time constants involved and the need to limit the demands imposed on the human users of the resultant system.

Within this technical topic area, proposals are solicited for research on:

- Network software components that facilitate the timely acquisition, processing and exchange of sensor-derived and actuator-destined information.
- Network-based approaches to the distribution and operation of embedded software that allow the capabilities of embedded devices to be upgraded or altered on a near-real-time basis.
- Novel network interface technologies that can achieve drastic reductions in costs, so as to make networked devices competitive with disconnected embedded solutions that sell for less than $1.
- Software technologies for autonomous systems that will allow human beings to control deeply networked systems, without the "in-the-loop" burden associated with traditional interactive computing.

(5) Other research related to NGI and Extensible Networks: DARPA welcomes novel proposals of wide ranging scope in the area of NGI and Extensible Networking, including techniques that enable ubiquitous connectivity, scalable middleware services, methods for efficiently networking a widely heterogeneous mix of traffic, and all-optical or mostly-optical packet routing. Efforts in these areas will be judged with regard to the novelty, breadth, and the potential impact of the vision.

ADDITIONAL INFORMATION:

Additional information on the DARPA and government-wide NGI programs can be found at URL: http://www.darpa.mil/ito/research/ngi and http://www.ngi.gov.
This reference is provided for information purposes only and is not considered an official part of this specific solicitation. The information presented at these web sites is occasionally updated without notification.

PROGRAM SCOPE:

Proposed research should investigate innovative approaches and techniques that lead to or enable revolutionary advances in the state-of-the-art. Proposals are not limited to the specific strategies listed above and alternative visions will be considered. However, proposals should be for research that substantially contributes towards the goals stated. Research should result in prototype hardware and/or software demonstrating integrated concepts and approaches. Specifically excluded is research that primarily results in evolutionary improvement to the existing state of practice or focuses on a specific system or solution. Integrated solution sets embodying significant technological advances are strongly encouraged over narrowly defined research endeavors. Proposals may involve other research groups or industrial cooperation and cost sharing.

SUBMISSION PROCESS:

Proposers are strongly encouraged to submit a proposal abstract in advance of actual proposals. This procedure is intended to minimize unnecessary effort in proposal preparation and review. An original and eight (8) copies of the proposal abstract must be submitted to DARPA/ITO, ATTN: BAA 99-06, 3701 North Fairfax Drive, Arlington, VA 22203-1714, in time to reach DARPA by 4:00 PM (ET), Monday, November 23, 1998, to guarantee review. An original and eight (8) copies of each proposal must be submitted to the administrative address for this BAA in time to reach DARPA by 4:00 PM (ET) Monday, January 11, 1999, in order to be considered. DARPA will acknowledge receipt of submissions and assign control numbers that should be used in all further correspondence regarding abstracts and proposals.

DARPA will attempt to review proposal abstracts within 30 days after receipt and will make a recommendation encouraging or discouraging formal proposal submissions. Proposal abstracts will be reviewed as they are received. Early submissions are strongly encouraged. Regardless of the recommendation, the decision to propose is the

responsibility of the proposer. All submitted proposals will be fully reviewed regardless of the disposition of the proposal abstract.

The typical proposal should express a consolidated effort in support of one or more technical topic areas. Disjoint efforts should not be included in a single proposal.

Restrictive notices notwithstanding, proposals may be handled, for administrative purposes only, by a support contractor. This support contractor is prohibited from competition in DARPA technical research and is bound by appropriate non-disclosure requirements.

EVALUATION AND FUNDING PROCESSES:

Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. DARPA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons. For evaluation purposes, a proposal is the document described in PROPOSAL FORMAT Section I and Section II (see below). Other supporting or background materials submitted with the proposal will be considered for the reviewer's convenience only and not considered as part of the proposal.

Evaluation of proposals will be accomplished through a scientific review of each proposal using the following criteria, which are listed in descending order of relative importance:
(1) overall scientific and technical merit,
(2) potential contribution and relevance to DARPA mission,
(3) offeror's capabilities and related experience,
(4) plans and capability to accomplish technology transition, and
(5) cost realism.

It is anticipated that all proposals will be reviewed by Government officials and non-government personnel; however, contractors will not be used to conduct evaluations or analyses of any aspect of a proposal submitted under this BAA unless one of the three conditions identified in FAR 37.203(d) applies.

As soon as the proposal evaluation is completed, the proposer will be notified of selectability or non-selectability. Selectable proposals will be considered for funding; non-selectable proposals will be destroyed. (Copies of non-selectable proposals may be retained for filing purposes.) Not all proposals deemed selectable will be funded. Decisions to fund selectable proposals will be based on funds available, scientific and technical merit, and potential contribution and relevance to DARPA's mission and offeror’s capabilities and expertise. DARPA may retain some selectable proposals for a period of up to one year in order to reconsider those proposals for funding. Submitters of those retained proposals will receive notification to that effect.

The Government reserves the right to select for award all, some, or none of the proposals received. Proposals identified for funding may result in a contract, grant, cooperative agreement, or other transaction depending upon the nature of the work proposed, the required degree of interaction between parties, and other factors. If warranted, portions of resulting awards may be segregated into pre-priced options.

GENERAL INFORMATION:

Proposals not meeting the format described in this pamphlet may not be reviewed. Proposals and proposal abstracts may not be submitted by fax; any so sent will be disregarded. The *Commerce Business Daily* notice, in conjunction with this pamphlet, BAA 99-06 Proposer Information, constitutes the total BAA. No additional information is available, nor will a formal RFP or other solicitation regarding this announcement be issued. Requests for same will be disregarded. All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities (HBCU) and Minority Institutions (MI) are encouraged to submit proposals and join others in submitting proposals. However, no portion of this BAA will be set aside for HBCU and MI participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities.

PROPOSAL ABSTRACT FORMAT:

Proposal abstracts are encouraged in advance of full proposals in order to provide potential offerors with a rapid response and to minimize unnecessary effort. The abstract submission should be clearly marked "PROPOSAL ABSTRACT" and should include a cover sheet and a technical section.

The cover sheet should include: (1) BAA number; (2) Technical topic area; (3) Proposal title; (4) Technical point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address; (5) Administrative point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address; (6) Summary of the costs of the proposed research, including total base cost, estimates of base cost in each year of the effort, estimates of itemized options in each year of the effort, and cost sharing if relevant; and (7) Contractor's type of business, selected from among the following categories: "LARGE BUSINESS," "SMALL DISADVANTAGED BUSINESS," "OTHER SMALL BUSINESS," "HBCU," "MI," "OTHER EDUCATIONAL," or "OTHER NONPROFIT."

The technical section of the abstract should include the following: A. {1 page} Innovative claims for the proposed research. This page is the centerpiece of the abstract and should succinctly describe the unique proposed contribution; and B. {4 pages} Technical rationale, technical approach and constructive plan for accomplishment of technical goals in support of innovative claims and deliverable products. Include comparison with other ongoing research indicating advantages and disadvantages of the proposed effort.

The total length of the abstract should not exceed six pages including the cover sheet. Proposal abstracts ONLY (not proposals) may alternatively be submitted via electronic mail to baa99-06@darpa.mil. E-mail submissions must be formatted as plain ASCII, 72 characters to the line, 60 lines to the page. This is the only format that will be accepted. No formal transmittal letter is required.

PROPOSAL FORMAT:

Proposals shall include the following sections, each starting on a new page (where a "page" is 8-1/2 by 11 inches with type not smaller than 12 point) and with text on one side only. The submission of other supporting materials along with the proposal is strongly discouraged. Sections I and II of the proposal shall not exceed 40 pages. Maximum page lengths for each section are shown in braces {} below.

Section I. Administrative

{1} Cover Page including: (1) BAA number; (2) Technical topic area; (3) Proposal title; (4) Technical point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address; (5) Administrative point of contact including: name, telephone number, electronic mail address, fax (if available) and mailing address; (6) Summary of the costs of the proposed research, including total base cost, estimates of base cost in each year of the effort, estimates of itemized options in each year of the effort, and cost sharing if relevant; and (7) Contractor's type of business, selected from among the following categories: "LARGE BUSINESS," "SMALL DISADVANTAGED BUSINESS," "OTHER SMALL BUSINESS," "HBCU," "MI," "OTHER EDUCATIONAL," or "OTHER NONPROFIT."

Section II. Detailed Proposal Information

This section provides the detailed discussion of the proposed work necessary to enable an in-depth review of the specific technical and managerial issues. Specific attention must be given to addressing both risk and payoff of the proposed work that make it desirable to DARPA.

A. {1} Innovative claims for the proposed research. This page is the centerpiece of the proposal and should succinctly describe the unique proposed contribution.

B. {18} Technical rationale, technical approach and constructive plan for accomplishment of technical goals in support of innovative claims and deliverables.

C. {2} Deliverables associated with the proposed research. Include in this section all proprietary claims to results, prototypes, or systems supporting and/or necessary for the use of the research, results, and/or prototype. If there are no proprietary claims, this should be stated. The offeror must submit a separate list of all technical data or

computer software that will be furnished to the Government with other than unlimited rights (see DFARS 227.)

D. {3} Statement of Work (SOW) written in plain English, outlining the scope of the effort and citing specific tasks to be performed and specific contractor requirements.

E. {1} Schedule of milestones for the proposed research.

F. {2} Technology Transfer. Description of the transferable technology and expected technology transfer path.

G. {3} Comparison with other ongoing research indicating advantages and disadvantages of the proposed effort.

H. {3} List of key personnel, concise summary of their qualifications, and discussion of proposer's previous accomplishments and work in this or closely related research areas. Indicate the level of effort to be expended by each person during each contract year and other (current and proposed) major sources of support for them and/or commitments of their efforts. DARPA expects all key personnel associated with a proposal to make substantial time commitment to the proposed activity.

I. {1} Description of the facilities that would be used for the proposed effort.

J. {5} Cost by task, with breakdown into accounting categories and equipment for the entire contract and for each contract year. Where the effort consists of multiple portions that could reasonably be partitioned for purposes of funding, these should be identified as contract options with separate cost estimates for each. Details of any cost sharing should also be included. Budgets for Government furnished/funded equipment should be limited to experimental apparatus and exclude office and laboratory equipment normally associated with Information Technology research environments, such as servers, workstations, PCs, laptops, PDAs, routers, printers, copiers, fax machines, etc.

Awards made under this BAA may be subject to the provisions of the Federal Acquisition Regulation (FAR) Subpart 9.5, Organizational Conflict of Interest. All offerors and proposed subcontractors must affirmatively state whether they are supporting any DARPA technical office(s) through an active contract or subcontract. "Support contract" or "support contractor" includes a contract or subcontract for acquisition of System Engineering and Technical Assistance (SETA) services, and other support service contracts in which any one of the following situations apply: have personnel who regularly maintain offices or frequently occupy space within DARPA; maintain external spaces in which DARPA personnel maintain offices or frequently occupy; or have personnel with any access to the DARPA fiscal database, EIS, or contractual or programmatic documentation related to other than their own contact(s). All affirmations must state which office(s) the offeror supports, and identify the prime contract number. Affirmations should be furnished at the time of proposal submission. All facts relevant to

the existence or potential existence of organizational conflicts of interest, as that term is defined in FAR 9.501, must be disclosed in Section II., H of the proposal, organized by task and year. This disclosure shall include a description of the action the Contractor has taken, or proposes to take, to avoid, neutralize, or mitigate such conflict.

Section III. Additional Information

A bibliography of relevant technical papers and research notes (published and unpublished) that document the technical ideas upon which the proposal is based. Copies of not more than three relevant papers may be included in the proposal submission; provide one set for the original proposal and one set for each of the eight (8) proposal copies. Please note: the materials listed in Section III. Additional Information, and submitted with the proposal, will be considered for the reviewer's convenience only and not considered as part of the proposal for evaluation purposes.

Additional Electronic Submission Encouraged

In ADDITION to the paper proposals, proposers are strongly encouraged to send ASCII text electronic copies of the statement of work and equipment needs to the following email address: baa99-06@darpa.mil. The title of the proposal and the name of the proposing organization must be provided as a header to enable administrative staff to match these electronic submissions with the full proposals. The statement of work and equipment budgets must be identical (except for format) to the statement of work in the full proposal.

The administrative addresses for this BAA are:

Fax: 703-522-7161 Addressed to: DARPA/ITO, BAA 99-06
Electronic Mail: baa99-06@darpa.mil
Electronic File Retrieval: http://www.ito.darpa.mil/Solicitations.html
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